

**ABSTRACT**

A system of taking images of different sensitivities at the same time uses both an image sensor, and an auxiliary part to the image sensor. The image sensor element can be a photogate, and the auxiliary part can be the floating diffusion associated with the photogate. Both the photogate and the floating diffusion accumulate charge. Both are sampled at different times. The floating diffusion provides a lower sensitivity amount of charge than the photogate itself. The system can have a photogate and floating diffusion in each pixel along with a select transistor, a reset transistor, and a follower transistor. All of this circuitry can be formed of CMOS for example. The system can also operate in a column/parallel mode, where each column of the photo sensor array can have a column signal processor which samples and holds the reset signal, the floating diffusion signal and the photogate signal.